## IN THE CLAIMS

No claims are amended, canceled or added herein. The presently-pending claims are provided for the convenience of the Examiner.

1-25. (Canceled)

26. (Original) A method for extending battery life in a cardiac pacing device that includes a pacing supply capacitor connected to a switching power supply and that is adapted to provide a series of pacing pulses from the pacing supply capacitor, the method comprising:

selecting a pacing supply operating frequency for the switching power supply to reduce a current required to recharge the pacing supply capacitor before a subsequent pacing pulse in the series of pacing pulses;

monitoring battery charge depletion that results in increasing charge times for the pacing supply capacitor; and

increasing the pacing supply operating frequency to compensate for the increasing charge times of the pacing supply capacitor.

27. (Original) The method of claim 26, wherein increasing the pacing supply operating frequency includes decreasing an input impedance of a switched capacitor supply in the cardiac pacing device an amount to offset an internal battery impedance gain attributable to the battery charge depletion so as to maintain a relatively uniform current required to recharge the pacing supply capacitor before the subsequent pacing pulse.

28. (Original) The method of claim 26, wherein monitoring battery charge depletion includes measuring a charge time for recharging the pacing supply capacitor.

29. (Original) The method of claim 26, wherein increasing the pacing supply operating frequency to compensate for the increasing charge times of the pacing supply capacitor

attributable to battery charge depletion includes increasing the pacing supply operating frequency settings to a discrete frequency setting from a number of discrete frequency settings.

30. (Original) The method of claim 29, further including providing the number of discrete frequency settings by dividing an input clock frequency (f) by a programmable integer count (n) such that the number of discrete frequency settings are provided by f / n for a given set of n, wherein n is an integer selected from a range of integers 1 through m.

31. (Original) The method of claim 30, further including providing the given set of n as a function of $2^x$, wherein x is an integer from a programmable counter.

32. (Original) The method of claim 31, wherein providing the given set of n as a function of $2^x$ includes providing 128, 64, 32, 16, 8, 4, 2, 1 as the given set of n.

33. (Original) The method of claim 26, further comprising:

recharging the pacing supply capacitor using a sequence of charge transfer cycles in which a removed battery charge for each charge transfer cycle exponentially diminishes along the sequence of charge transfer cycles as the pacing supply capacitor is charged; and

varying a time interval between charge transfer cycles such that the sequence of charge transfer cycles is an inverse of the exponentially diminishing removed battery charge.

34. (Original) The method of claim 33, wherein varying a time interval between charge transfer cycles includes:

counting a number of fill-dump cycles (N) needed to recharge the pacing capacitor following a pace;

determining a paced cardiac cycle interval (Tcyc);

measuring an increase in voltage (ΔVTotal) added to the pacing supply capacitor following the pace; and

loading a presettable delay counter (Ti) for a next charge transfer cycle interval (I) with Ti = Tcyc (ΔV(I)/ΔVTotal).

35. (Original) The method of claim 26, further comprising increasing a voltage multiplier setting for the switching power supply to compensate for battery charge depletion.

36. (Original) The method of claim 35, further comprising choosing the voltage multiplier setting from a multiplicity of voltage multiplier settings that includes at least one voltage attenuation setting.

37. (Original) The method of claim 36, further comprising choosing the voltage multiplier setting from 0.5x, 0.66x, 1.0x, 1.5x, 2.0x, 3.0x.

38. (Original) A method for extending battery life in a cardiac pacing device that includes a pacing supply capacitor connected to a switching power supply and that is adapted to provide a series of pacing pulses from the pacing supply capacitor, the method comprising:

setting a pacing supply operating frequency setting for the switching power supply to a first rate that is greater than a setting in which a charge time for the pacing supply capacitor is greater than a cardiac cycle interval;

setting a voltage multiplier setting for the switching power supply to a reduced setting that is greater than Vpace/Vstop; and

reducing the pacing supply operating frequency setting to a reduced setting that is greater than the setting in which the charge time for the pacing supply capacitor is greater than the cardiac cycle interval.

39. (Original) The method of claim 38, wherein reducing the pacing supply operating frequency setting to a reduced setting includes reducing the pacing supply operating frequency by a number of discrete frequency settings.

40. (Original) The method of claim 39, further including providing the number of discrete frequency settings by dividing an input clock frequency (f) by a programmable integer count (n) such that the number of discrete frequency settings are provided by f / n for a given set of n.

41. (Original) The method of claim 40, further including providing the given set of n as a function of $2^x$, wherein x is an integer from a programmable counter.

42. (Original) The method of claim 41, wherein providing the given set of n as a function of $2^x$ includes providing {128, 64, 32, 16, 8, 4, 2, 1} as the given set of n.

43. (Original) The method of claim 39, further including gradually increasing the pacing supply operating frequency over a time period of diminishing battery charge.

44. (Original) The method of claim 39, further including gradually increasing the pacing supply operating frequency at specific time intervals after pacemaker activation in a patient.

45. (Original) The method of claim 39, further including:

reading a feature that indicates a battery strength; and

increasing the pacing supply operating frequency to compensate for battery charge depletion upon reading a feature that indicates battery charge depletion.

46. (Original) The method of claim 45, wherein reading a feature that indicates a battery strength includes determining a current.

47. (Original) The method of claim 45, wherein reading a feature that indicates a battery strength includes determining a voltage.

48. (Original) The method of claim 45, wherein reading a feature that indicates a battery strength includes determining a battery resistance.

49. (Original) The method of claim 45, wherein reading a feature that indicates a battery strength includes measuring a charge time of a pace storage capacitor.

50. (Original) A cardiac stimulating device, comprising:

a power terminal for a battery;

a pacing supply capacitor; and

a switching power supply connected to the power terminal and the pacing supply capacitor, and adapted for receiving current from the battery and charging the pacing supply capacitor, the switching power supply including:

at least two capacitors having a fill configuration for receiving charge from the battery and a dump configuration for transferring charge to the pacing supply capacitor; and

a frequency input for controlling a switching frequency between the fill configuration and the dump configuration such that the switching frequency is capable of being adjusted to extend battery life.

51. (Original) The device of claim 50, wherein the switching power supply includes a modifiable switch topology and a voltage input for controlling a voltage multiplier setting from the power terminal to the pacing supply capacitor by modifying the switch topology.

52. (Original) The device of claim 51, wherein the voltage multiplier setting is chosen from a multiplicity of voltage multiplier settings that includes at least one voltage attenuation setting.

53. (Original) The device of claim 52, wherein the multiplicity of voltage multiplier settings include 0.5x, 0.66x, 1.0x, 1.5x, 2.0x, 3.0x.

54. (Original) The device of claim 51, further comprising a memory that contains executable instructions to automatically vary the voltage multiplier setting and the switching frequency.

55. (Original) The device of claim 50, further comprising a memory that contains executable instructions to automatically vary the switching frequency.

56. (Original) The device of claim 50, further comprising frequency controlling circuitry connected to the frequency input of the switching power supply.

57. (Original) The device of claim 56, wherein the device is an implantable device, and the frequency controlling circuitry is adapted to noninvasively vary the switching frequency to extend battery life.

58. (Original) The device of claim 56, wherein the frequency controlling circuitry is adapted to gradually change the switching frequency over a time period in which a battery charge is expected to diminish.

59. (Original) The device of claim 56, wherein the frequency controlling circuitry is adapted to gradually change the switching frequency at specific time intervals after device activation using a timing function.

60. (Original) The device of claim 56, wherein the frequency controlling circuitry is adapted to read a feature that indicates a battery strength, and vary the switching frequency based on the feature.

61. (Original) The device of claim 60, wherein the frequency controlling circuitry is adapted to determine a current as an indication of battery strength.

62. (Original) The device of claim 60, wherein the frequency controlling circuitry is adapted to determine a voltage as an indication of battery strength.

63. (Original) The device of claim 60, wherein the frequency controlling circuitry is adapted to determine a battery resistance as an indication of battery strength.

64. (Original) The device of claim 60, wherein the frequency controlling circuitry is adapted to measure a charge time of a pace storage capacitor as an indication of battery strength.

65. (Original) The device of claim 56, wherein the frequency controlling circuitry includes a programmable frequency divider connected to the frequency input, wherein the programmable frequency divider includes a programmable counter and is adapted to digitally divide a clock reference by an integer n using the programmable counter.

66. (Original) The device of claim 65, wherein the frequency controlling circuitry is adapted to provide a set of integer n a function of $n = 2^x$, wherein x is an integer from the programmable counter.

67. (Original) The device of claim 65, wherein the frequency controlling circuitry is adapted to provide 128, 64, 32, 16, 8, 4, 2, 1 as the set of integer n.

68. (Original) The device of claim 50, wherein the frequency controlling circuitry is adapted to control impedance presented to the power terminal so as to provide a relatively uniform current that is approximately the average charge required to replenish the power supply capacitor divided by a cardiac cycle.

69. (Original) A cardiac stimulating device, comprising:

a power terminal for a battery;

a pacing supply capacitor;

a switching power supply connected to the power terminal and the pacing supply capacitor, and adapted for receiving current from the battery and charging the pacing supply capacitor, the switching power supply including at least two capacitors with a fill configuration for receiving charge from the battery and a dump configuration for transferring charge to the pacing supply capacitor; and

frequency controlling circuitry for controlling a switching frequency between the fill configuration and the dump configuration such that the switching frequency is capable of being adjusted to extend battery life, the frequency controlling circuitry being adapted to:

control impedance presented to the battery terminal by adjusting the switching frequency so as to provide a relatively uniform current that is approximately an average charge required to replenish the pacing supply capacitor divided by a cardiac cycle;

read a feature that indicates a battery strength; and

alter the switching frequency based on the feature.

70. (Original) The device of claim 69, wherein the frequency controlling circuitry is adapted to determine a current to indicate battery strength.

71. (Original) The device of claim 69, wherein the frequency controlling circuitry is adapted to determine a voltage to indicate battery strength.

72. (Original) The device of claim 69, wherein the frequency controlling circuitry is adapted to determine a battery resistance to indicate battery strength.

73. (Original) The device of claim 69, wherein the frequency controlling circuitry is adapted to measure a charge time of a pace storage capacitor to indicate battery strength.

74. (Original) The device of claim 69, wherein the frequency controlling circuitry includes a programmable frequency divider connected to the frequency input, wherein the programmable frequency divider includes a programmable counter and is adapted to digitally divide a clock reference by an integer n using the programmable counter.

75. (Original) The device of claim 69, wherein the switching power supply includes a modifiable switch topology and a voltage input for controlling a voltage multiplier setting from the power terminal to the pacing supply capacitor by modifying the switch topology.

76. (Original) The device of claim 75, further comprising a memory that contains executable instructions to automatically vary the voltage multiplier setting and the switching frequency.

77. (Original) The device of claim 69, further comprising a memory that contains executable instructions to automatically vary the switching frequency.

78. (Original) The device of claim 69, wherein the device is an implantable device, and the frequency controlling circuitry is adapted to noninvasively vary the switching frequency to extend battery life.